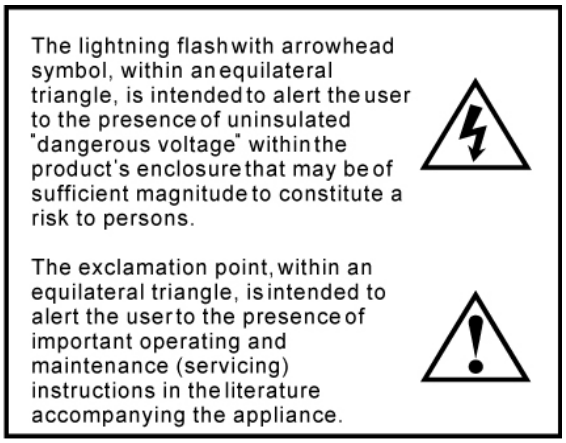
XP-2040/3060/4080

Loudspeaker Management System

User Manual

XILICA Audio Design

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL


The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk to persons.
The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Important Safety Instructions

1. READ THESE INSTRUCTIONS
All the safety and operating instructions should be read before the product is operated.

2. KEEP THESE INSTRUCTIONS
The safety and operating instructions should be retained for future reference.

3. HEED ALL WARNINGS
All warnings on the product and in the operating instructions should be adhered to.

4. FOLLOW ALL INSTRUCTIONS
All operating and use of instructions should be followed.

5. DO NOT USE THIS APPARATUS NEAR WATER
Do not use the product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

6. CLEAN ONLY WITH DRY CLOTH
Unplug the unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. DO NOT BLOCK ANY VENTILATION OPENINGS
Slots and openings in the cabinet back or bottom are provided for ventilation, to ensure reliable operation of the limit and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should never be placed near or over a radiator or heat source. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacture's instructions have been adhered to.

8. DO NOT INSTALL NEAR ANY HEAT SOURCES
This Product should be situated away from heat sources such as radiators, stoves, or other products (including amplifiers) that produces heat.

9. DO NOT DEFEAT THE SAFETY PURPOSE OF THE POLARIZED OR GROUNDING-TYPE PLUG
A Polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prongs are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. PROTECT THE POWER CORD FROM BEING WALKED ON OR PINCHED PARTICULARLY AT PLUGS, CONVENIENCE RECEPTACLES, AND THE POINT WHERE THEY EXIT FROM THE APPARATUS.

11. ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

12. USE ONLY WITH CART, STAND, TRIPOD, BRACKET, OR TABLE SPECIFIED BY THE MANUFACTURER, OR SOLD WITH THE APPARATUS. WHEN A CART IS USED, USE CAUTION WHEN MOVING THE CART/APPARATUS TO AVOID INJURY FROM TIP-OVER.
Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury to someone, and serious damage to the appliance. A unit and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

13. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.
For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

14. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANYWAY, SUCH AS WHEN THE POWER SUPPLY CORD OR PLUG IS DAMAGED, LIQUID HAS BEEN SPILLED OR OBJECTS HAVE FALLEN INTO THE APPARATUS, THE APPARATUS HAS BEEN EXPOSED TO RAIN OR MOISTURE, DOES NOT OPERATE NORMALLY, OR HAS BEEN FROPPED.

15. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

16. APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

Table of Contents

Table of Contents 4

1.0 Introduction 5

2.0 Features 6

3.0 Front Panel Functions 7

4.0 Rear Panel Functions 9

5.0 Powering Up the Device 10

6.0 Operating the Device 11

6.1 Input menus 11

6.2 Output Menus 16

6.3 System Menus 18

7.0 Quick Reference 22

8.0 PC Control Software 23

9.0 Specifications 24

10.0 Warranty 26

1.0 Introduction

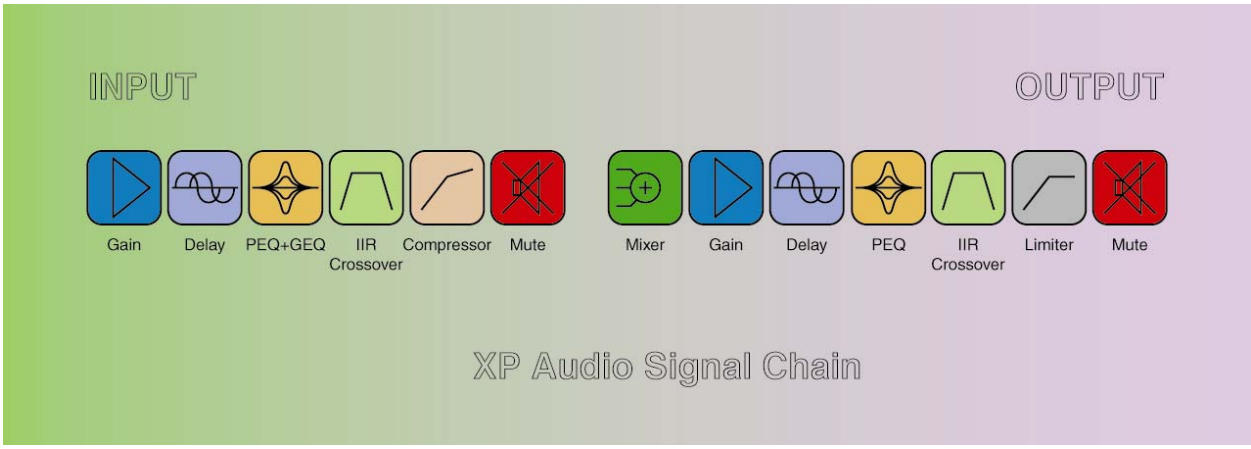
The XP series is a digital loudspeaker management system designed for the touring or fixed sound installation markets. The absolute latest in available technology is utilized with 40-bit floating point processors and high performance 24-bit Analog Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices. A complete set of parameters include I/O levels, delay, polarity, 8 bands of parametric EQ per channel, 31 bands of GEQ per input, multiple crossover selections and full function limiters. Precise frequency control is achieved with its 1 Hz resolution. Inputs and outputs can be routed in multiple configurations to meet any requirement. The XP series can be controlled or configured in real time on the front panel or with the intuitive PC GUI accessed via the RS-232, USB or the optional Ethernet interface. Software upgrade for CPU and DSP via PC keeps the device current with newly developed algorithms and functions once available. Multiple setup storage and system security complete this professional package.

Shipped contents:

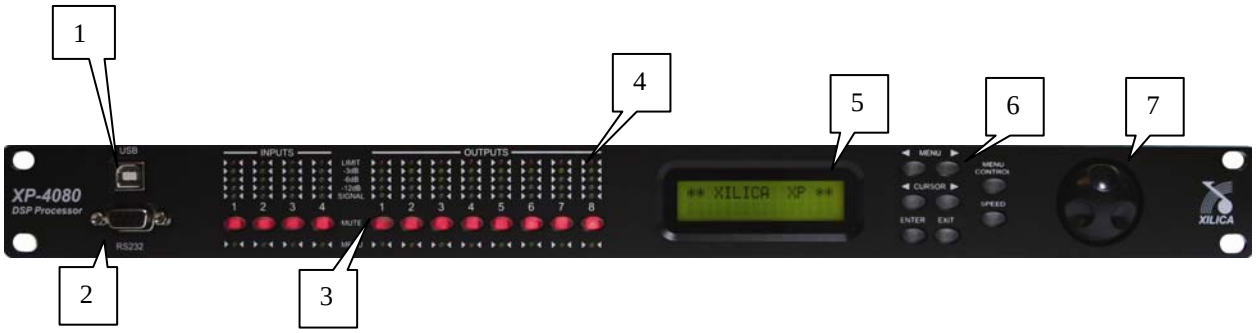
- XP-2040/3060/4080 unit
- User Manual
- XConsole Software CD

2.0 Features

> Flexible routing between Inputs and Outputs
> 40-bit floating point DSP
> High Performance 24-bit A/D Converters
> 1 Hz Frequency Resolution
> 8 Parametric Equalizers for each Input and Output
> 31 Bands GEQ for each Input
> Multiple Crossover types with Full Function Limiters
> Precise Level, Polarity and Delay
> CPU and DSP upgrade via PC
> Individual Channel Buttons with Linking capability
> 2-Line x 16 Character Backlit LCD Display
> Full 5-segment LED's on every Input and Output
> Storage of up to 30 Program Setups
> Security Lock
> RS-232 and USB Interface for PC Control and Configuration
> Future options available



3.0 Front Panel Functions



1. **USB** – a standard Type B USB connector. Proper device driver must be installed prior to usage.

2. **RS232** – a standard female DB9 socket. A straight through cable is required for PC connection.

3. **Mute keys** – Mute/Unmute input and output channels. When an input channel is muted, a red LED will come on for indication.

   When **Menu Control** key is pressed, it selects the corresponding channel for the LCD menu display and is acknowledged by a green LED below the button. The last modified menu will be displayed on the LCD. While the Menu Control key is hold down, multiple channels can be linked or unlinked by pushing the desired channels. This eases programming for same parameters across multiple channels. Multiple Inputs can be linked together and multiple outputs can be linked together. Inputs and Outputs are linked separately.

4. **Peak Level LED** - Indicates the current peak level of the Signal: Signal, -12dB, -6dB, -3dB, Over/Limit. The Input **Over** LED references to the device's maximum headroom. The Output **Limit** LED references to the threshold of the limiter.

5. **LCD** - Shows all the necessary information to control the unit.

6. **Menu keys** - There are 8 menu keys: **<<Menu** (Menu Down), **Menu>>** (Menu Up), **<<Cursor** (Cursor Down), **Cursor>>** (Cursor Up), **Enter/Sys**, **Exit**, **Speed** and **Menu Control**. The functions of each key is explained below:

<<Menu:	Previous menu screen
Menu>>:	Next menu screen
<<Cursor:	Previous cursor in the menu screen
Cursor>>:	Next cursor in the menu screen
Enter/Sys:	**Enter** is used only in the **System Menu** to proceed with selected actions **Sys** enters the **System Menu** from the main menu.
Exit:	Exit to the **Main Menu**
Menu Control:	Holding this button down while pressing **Mute** key will go to the specify channel menu.
Speed:	**Speed** modifies delay and frequency (1 Hz resolution mode) data values by 100X.

7. **Rotary Thumb Wheel** - Changes parameter data values. The wheel has travel velocity sensing which ease large incremental data modifications. For modifying delay and frequency (1 Hz resolution), pressing the **Speed** key simultaneously will increment/decrement the data value by 100X.

4.0 Rear Panel Functions

1. **Main Power** - Connects via a standard IEC socket. A compatible power cord is supplied with the unit. The voltage input is 90-240VAC, 50-60Hz.

2. **Main Fuse** - T2.5A-250V. Slow blow type.

3. **Power switch** - Controls power On/Off.

4. **Option slot** - Option slot for Ethernet and Wall Controller jack.

5. **XLR input and outputs -** Separate 3-pin XLR connectors are provided for each audio input and output. The device's output stage employs the balanced impedance topology. All I/O connectors have pin 1 as ground (shield), pin 2 as + and pin 3 as -.

5.0 Powering Up the Device

- After powering up the unit, the following initialization screen is displayed on the LCD:

```
** XILICA  XP **
XP-4080    v1.00
```

- The initialization process takes about 8 seconds and during that period the unit boots and displays the device model and firmware version.

- After the initialization process is finished the XP displays its main screen:

```
** XILICA  XP **
P01 XXXXXXXXXXX
```

- The screen shows the current program number and program name assigned to the unit. If the 2 fields are empty, it means that no program is assigned, the last data before previous power down is recalled instead.

- Now the XP is ready to operate.

6.0 Operating the Device

Tips: Channel Linking – While holding down the **Menu Control** key, more than 1 channel from the same group (Input or Output group) can be selected to link the channels together. The green LEDs below the **Mute** buttons are lit for the linked channels. Any modification of the data for the selected channel will be applied to the linked channels as well. To cancel the linking, simply deselect the desired channel if the **Menu Control** key is still pressed. If the **Menu Control** key is already released, just press the **Exit** key.

6.1 Input menus

Each of XP input channels has a separate **Menu** key. There are 6 menus for each input channel.

Signal - Signal parameters

- LEVEL - Gain, -40.00dB to +15.00dB in 0.25dB steps.

```
I1:XXXXXX Signal
LEVEL:0.00dB
```

- POL - Polarity, can be normal (+) or inverted (-).

```
I1:XXXXXX Signal
POL:+
```

- DELAY - Delay in 21us steps. Can be displayed in ms, ft or m. The time unit of the delay can be changed in the **System** menu. The maximum delay permitted is 4,800 steps (100ms).

```
I1:XXXXXX Signal
DELAY:000.000ms
```

EQ - EQ parameters

- EQ# - Selects one of the 8 available Equalizers.

```
I1:XXXXXX EQ1
EQ#:1
```

- Type - Type of EQ. The types can be parametric (PEQ), Lo-shelf (Lo-shf) and Hi-shelf (Hi-shf).

```
I1:XXXXXX EQ
Type:PEQ
```

- FREQ - EQ center frequency. Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps. The sampling rate and the frequency steps can be selected in the **System Menu**.

```
I1:XXXXXX EQ
FREQ:1000Hz
```

- BW - EQ Bandwidth. Ranges from 0.02 to 2.50 octaves in steps of 0.01 octave steps for PEQ. The Q value is automatically shown beneath the octave value. For Lo-Slf or Hi-Shf, it is either 6 or 12dB/Oct.

```
I1:XXXXXX EQ
BW:0.33 Q=4.36
```

- LEVEL - EQ level gain. Ranges from -30.00dB to +15.00dB in 0.25dB steps.

```
I1:XXXXXX EQ
LEVEL:0.00dB
```

GEQ – GEQ parameters

- GEQ# - Selects one of the 31 available GEQ. The frequency corresponding the each number is also shown.

```
I1:XXXXXX  GEQ1
GEQ#:1   f=20
```

- LEVEL – GEQ level gain. Ranges from -30.00dB to +15.00dB in 0.25dB steps.

```
I1:XXXXXX  GEQ1
LEVEL:0.00dB
```

- BW - GEQ Bandwidth. Ranges from 0.10 to 0.50 octaves in steps of 0.01 octave steps.

```
I1:XXXXXX  GEQ1
BW:0.33oct
```

XOver **-** Crossover parameters

- FTRL - Filter Type of low frequency crossover point (high pass). Types can be Butterworth, Linkritz Riley or Bessel.

```
O1:XXXXXX XOver
FTRL:Off
```

- FRQL - Filter cut-off Frequency of low frequency crossover point (high pass). Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps. The frequency steps can be selected in the **System Menu**.

```
O1:XXXXXX XOver
FRQL:1000Hz
```

- SLPL - Filter Slope of low frequency crossover point (high pass). Ranges from 6 to 48dB/octave. If the selected Filter Type is Linkritz Riley, the available slopes are 12 / 24 / 36 / 48 dB/octave.

```
O1:XXXXXX XOver
SLPL:24dB
```

- FTRH - Filter Type of high frequency crossover point (low pass).

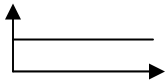
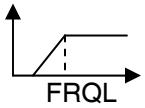
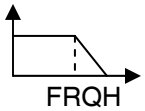
```
O1:XXXXXX XOver
FTRH:Off
```

- FRQH - Filter cut-off Frequency of high frequency crossover point (low pass).

```
O1:XXXXXX XOver
FRQH:1000Hz
```

- SLPH - Filter Slope of high frequency crossover point (low pass).

```
O1:XXXXXX XOver
SLPH:24dB
```

Filter configuration	Low crossover point	High crossover point	
None	FTRL Off	FTRH Off	
Highpass	FTRL not Off	FTRH Off	
Lowpass	FTRL Off	FTRH not Off	
Bandpass	FTRL not Off	FTRH not Off	

Compressor - Input Compressor

- THRESH - Limit Threshold. Ranges from -20 to +20dBu in 0.5dB steps.

```
O1:XXXXXX Comp
THRESH:+20.0dB
```

- ATTACK - Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1ms steps.

```
O1:XXXXXX Comp
ATTACK:10ms
```

- RELEASE - Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

```
O1:XXXXXX Comp
RELEASE:8X
```

- RATIO – Slope in which the signal is compressor. Ranges from 1/40 to 40/40.

```
O1:XXXXXX Comp
RATIO:40/40
```

Ch-Name - Channel Name

```
I1:XXXXXX ChName
NAME:XXXXXX
```

- Name - Channel name. It is 6 characters in length.

6.2 Output Menus

Each output channel of the XP has a separate menu key. There are 6 menus for each output channel.

Signal - Signal parameters

- Refer to the Input Menus for details

EQ - EQ paramters

- Refer to the Input Menus for details

XOver - Crossover parameters

- Refer to the Input Menus for details

Limit - Output Limter

- THRESH - Limit Threshold. Ranges from -20 to +20dBu in 0.5dB steps.

```
O1:XXXXXX Limit
THRESH:+20.0dB
```

- ATTACK - Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1ms steps.

```
O1:XXXXXX Limit
ATTACK:10ms
```

- RELEASE - Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.

```
O1:XXXXXX Limit
RELEASE:8X
```

Source - Input Mixer

- 1,2,3 – Input channel source for the current output channel. Can be used to mix the input source or disable it (Off). If more than one input sources are enabled, they will be added together as the source for the current output channel.

```
O1:XXXXXX Source
In1:-14.00
```

```
O1:XXXXXX Source
In2:0.00
```

```
O1:XXXXXX Source
In3:Off
```

Ch-Name - Channel Name

- Refer to the Input Menus for details

6.3 System Menus

The **System Menus** allow the user to control and change parameters that are related to the system behavior and general operation. It can be accessed by pressing the **Sys** key in the main menu (when no Input/Output or System Menu is activated). All System Menus require the Enter key to be pressed for the selected action.

Recall - Program Recall

The XP has a built in non-volatile memory that can store up to 30 different program setups. A program can be recalled using this menu.

- PROG - Program Number to be recalled.

```
SYSTEM    Recall
P:1 XXXXXXXXXXX
```

Store - Program store

The XP has a built in non-volatile memory that can store up to 30 different program setups. A program can be stored using this menu. The old program with the same program number will be replaced. Once the program is stored in the flash memory, it can be recalled at a later time, even after power down.

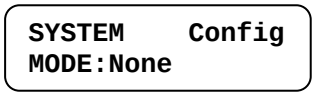
- PROG - Program Number for the current data to be stored.

```
SYSTEM     Store
P:1
```

- NAM - Program Name, allows a maximum length of 12 characters.

```
SYSTEM     Store
NAM:XXXXXXXXXXX
```

Config - Device Configuration



- MODE - configures the mode of operation.

Mode:	Out 1	Out 2	Out 3	Out 4	Out 5	Out 6
None	Any	Any	Any	Any	Any	Any
Stereo 2-Way	In1	In1	In2	In2	Any	Any
Stereo 3-Way	In1	In1	In1	In2	In2	In2

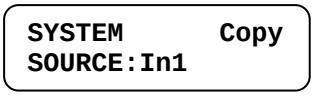
The unit assigns the Input source for the corresponding outputs when the Mode of Configuration is selected. The crossover point parameters like the filter type, cut-off frequency and slope have to be configured manually in the **Xover** Menu in each Output menu.

*Note: The configuration mode configures the input sources when selected. The user can change the source afterwards if desired. It does not keep the configuration in memory.

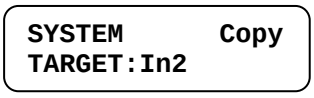
Copy - Copy channels

Copy Channels from the source to the target. When the Source and Targets are both Inputs and Outputs, all audio parameters will be copied. When one of the Source or the Target is an input while the other is an output, only the Level, Polarity, Delay and EQ are copied.

- SOURCE - Channel to be copied from.



- TARGET - Channel to be copied to.



General - General system parameters

- FREQ MODE - Selects the frequency control mode for EQ and crossover filters. Can be 36 steps/octave or All Frequencies (1 Hz resolution).

```
SYSTEM    Generl
FREQ MODE:All
```

- DELAY UNIT - ms, ft or m.

```
SYSTEM    Generl
DELAY UNIT:ms
```

Communication – Serial Communication parameters

- PORT - Select which type of serial communication device to use.

```
SYSTEM    Comm
PORT:RS232/USB
```

- BAUD RATE - Select the baud rate of the serial communication.

```
SYSTEM    Comm
BAUD RATE:115200
```

- DEVICE # - Assigns the device ID from 1 to 16. This ID is useful when a network of more than 1 unit is present.

```
SYSTEM    Comm
DEVICE #:1
```

Temperature – System Internal Temperature

```
SYSTEM    Temp
T:+32.5C/90.4F
```

Security - Security Lock

The XP enables the user to secure the unit and prevent undesired changes in the setup. In order to lock/unlock the unit the user must enter the correct password.

- PASSWORD – The password of the XP is 4 characters in length. The user can change it via the PC application software. The factory default of a new unit does not require a password.

```
SYSTEM    Secure
PASSWORD:XXXX
```

7.0 Quick Reference

Parameters	Menu <<Menu>>	Field <<Cursor>>	Min	Max	Steps	Units
Level	Signal	LEVEL	-40	+15	0.25	dB
Polarity	Signal	POL	+ / -			
Delay	Signal	DELAY	0	9,600	1	21us steps
EQ Number	EQ	EQ#	1	8	1	
EQ Level	EQ	LEVEL	-30	+15	0.25	dB
EQ Frequency	EQ	FREQ	20	20,000	1	Hz
EQ Bandwidth	EQ	BW	0.02	2.50	0.01	Octave
Crossover Low	XOver	FTRL	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover Low	XOver	FRQL	20	20,000	1	Hz
Crossover Low	XOver	SLPL	6	48	6	dB/octave
Crossover High	XOver	FTRH	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover High	XOver	FRQH	20	20,000	1	Hz
Crossover High	XOver	SLPH	6	48	6	dB/octave
Out Limit Thresh	Limit	THRESH	-20	+20	0.5	dBu
Out Attack Time	Limit	ATTACK	0.3	100	0.1/1	ms
Out Release Time	Limit	RELEASE	2 / 4 / 8 / 16 / 32X Attack time			
Source	Source	1, 2, 3	Off / On			
Channel Name	Ch-Name	NAME	6 characters			

8.0 PC Control Software

The XP series is shipped with a special PC Graphic User Interface (GUI) application - XConsole. XConsole gives the user an option to control the unit from a remote PC via the serial communication link. The GUI application makes it much easier to control and monitor the device, allowing the user to get the whole picture on one screen. Programs can be recalled and stored from/to PC's hard drive, thus expanding the storage to become virtually limitless.

9.0 Specifications

Inputs and Outputs

Input Impedance:	>10k Ohms
Output Impedance:	50 Ohms
Maximum Level:	+20dBu
Type:	Electronically balanced

Audio Performance

Frequency Response:	+/- 0.1dB (20 to 20kHz)
Dynamic Range:	115dB typ (unweighted)
CMMR:	> 60dB (50 to 10kHz)
Crosstalk:	< -100dB
Distortion:	0.002% (1kHz @+4dBu)

Digital Audio Performance

Processor:	40-bit
Sampling Rate:	48kHz
Analog Converters:	High Performance 24-bit
Propagation Delay:	1.8ms

Front Panel Controls

Display:	2 x 16 Character Backlit LCD
Level Meters:	5 segment LED
Buttons:	Mute/Edit Controls Menu Controls
Dial Encoder:	Embedded Thumb Wheel

Connectors

Audio:	3-pin XLR
RS-232:	Female DB-9
USB:	Type B
Power:	Standard IEC Socket

General

Power:	90-240 VAC (50-60Hz)
Dimensions:	19”x1.75”x9” (483x44x229 mm)
Weight:	7lbs / 3.2kg

Audio Control Parameters

Gain:	-40 to +15dB in 0.25dB steps
Polarity:	+/-
Delay:	Up to 100ms per I/O

Parametric Equalizers (8 per I/O)

Type:	Parametric, Hi-shelf, Lo-shelf
Gain:	-30 to +15dB in 0.25dB steps
Bandwidth:	0.02 to 2.50 octaves (Q=0.5 to 72)

31-Band Graphic Equalizers (1 per Input)

Gain:	-30 to +15dB in 0.25dB steps
Bandwidth:	0.10 to 0..50 octaves

Crossover Filters (2 per Input / Output)

Filter Types:	Butterworth, Bessel, Linkwitz Riley
Slopes:	6 to 48dB/oct

Limiters

Threshold:	-20 to +20dBu
Attack:	0.3 to 100ms
Release:	2 to 32X the attack time

System Parameters

No. of Programs:	30
Program Names:	12 character length
Delay Units:	ms, ft, m
Frequency Modes:	36 steps/oct, 1Hz resolution
Security Lock:	Lock/Unlock
Copy channels:	All parameters
Channel Names:	6 character length

Note: Specifications subject to change without notice

10.0 Warranty

The XP-2040/4080 is warranted covering materials and workmanship for a period of two (2) years, as determined by the date of retail purchase (according to the sales receipt from an authorized dealer) or the date of manufacture if the sales receipt is not available (according to the serial number). This warranty applies to the product; therefore, the remainder of the warranty period will be automatically transferred to any subsequent owner. This warranty applies only to failure of a Xilica product caused by defects in materials and workmanship during the stated warranty period. It does not apply to a unit that has been subjected to abuse, accident, modification, improper handling/installation, or repairs made without factory authorization or by anyone other than authorized Xilica Field Service Stations. This warranty is void if the serial number has been defaced, altered or removed. Products covered by this warranty will be repaired or replaced at the option of Xilica, without charge for materials or labor, provided all the terms of this warranty have been met.

For factory service, please call or email for a Return Authorization (R/A) number before shipping. If the product is shipped, the following information must be included in the package:
1. Owner's complete name, daytime phone number, return street address and return authorization number.
2. The serial number of the product being returned and a copy of the retail sales receipt, if possible.
3. A complete description of the problem(s) experienced, including a brief description of how the equipment is being used and other equipments involved.

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XILICA Audio Design

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